

1      **ABSTRACT**

2      A scrambling architecture protects data streams in the operating system and  
3 hardware components of a computer by scrambling the otherwise raw data prior to  
4 the data being handled by the operating system. The architecture has a scrambler  
5 implemented at either the client or the server that adds noise to the content. More  
6 specifically, the scrambler produces periodic sets of tone patterns having varying  
7 amplitudes based on a first key. The scrambler also generates a random signal  
8 based on the first key and a second key. The tone patterns and random signal are  
9 added to the content to scramble the content. The scrambled content is then  
10 passed to the filter graph (or other processing system) where the content is  
11 processed while scrambled. Any attacker attempting to siphon off the bits during  
12 processing will steal only noisy data, which is worthless for redistribution or  
13 copying purposes. After processing, the scrambled data is passed to a driver for  
14 output. The driver implements a descrambler to unscramble the content by  
15 subtracting out the random noise signal. The descrambler detects the tone patterns  
16 in the content and recovers the first key from the varying amplitudes of the tone  
17 patterns. The descrambler also receives the second key via a separate channel  
18 (e.g., a cryptographically secured path) and generates the same random signal  
19 using the recovered first key and the second key. The descrambler subtracts the  
20 tone patterns and the random signal from the scrambled content to restore the  
21 content.